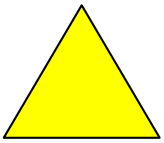
Keeler

API2/2

Indirect Ophthalmoscope

Service Manual

CE



ALWAYS READ THE INSTRUCTIONS

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Issue A 07/07/2008 2415-P-7010

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Introduction

The unit is made up of a number of sub-assemblies. Some of these assemblies require parts to be assembled using jigs and fixings. Since this involves either RTV silicon compound or heat staking it is unlikely that any of the parts can be recovered from the old assembly when a replacement part is required. Individual parts from these assemblies are not therefore identified in this manual.

The Optical Baseplate needs to be aligned on a laser jig to eliminate hyperphoria and should not be adjusted without the jig.

The manual covers the disassembly and reassembly of the various modules and their removal and replacement from the main unit.

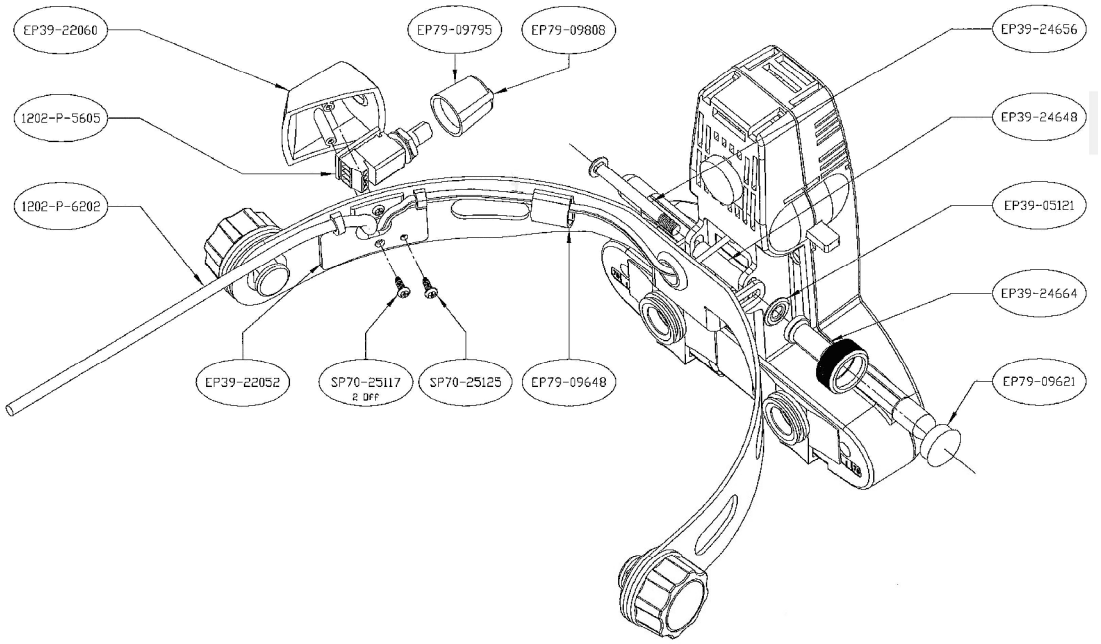
All mirrors are silvered on the front face – Take care not to touch the silvered surface.

Tools Required

In addition to the tools expected to be in a standard tool kit the following are required.

Lockring Key TD351	OD = 18mm, ID = 14mm, Teeth = 1mm x 0.5mm deep

Initial Disassembly



Remove the Intensity Control from the Browbar by removing 2 off self tapping screws.

Remove the Cable Guide by removing 1 off self tapping screw.

Remove the white insert in the Knob by sliding it out.

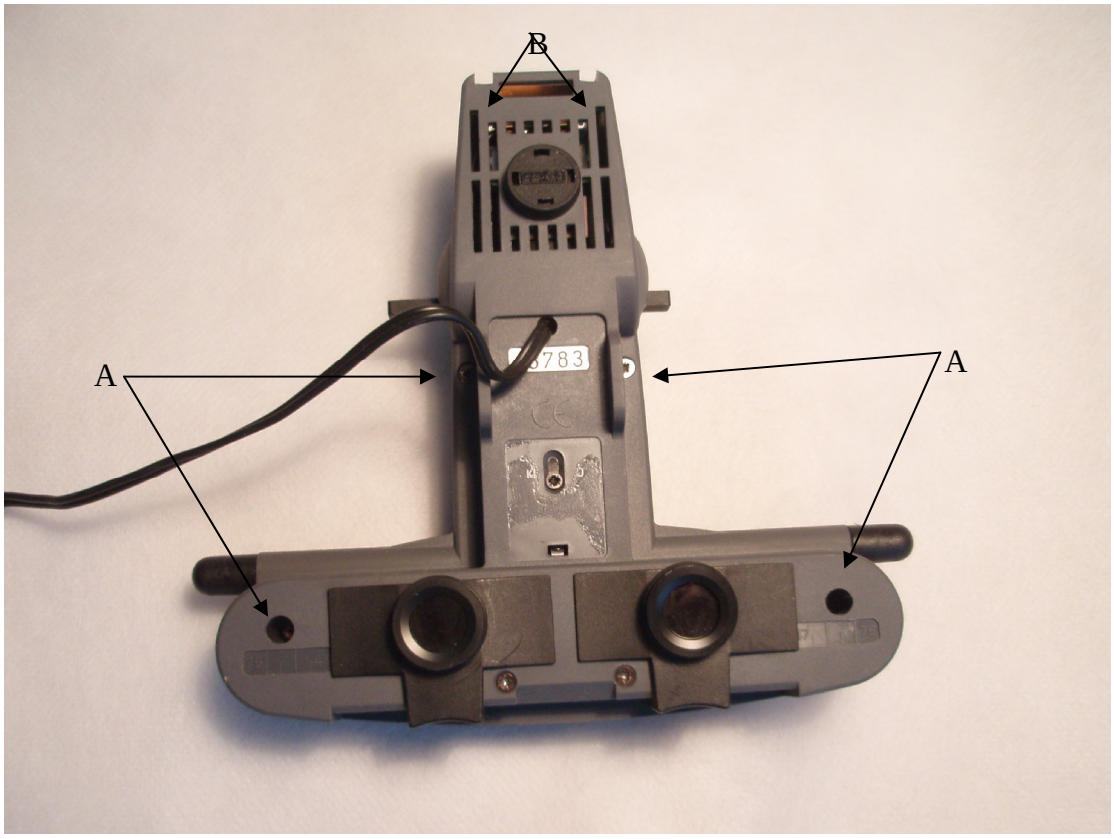
Undo the Allen screw in the Knob and remove the Knob.

Remove the nut holding the potentiometer to the Control Housing and remove the Housing.

The PCB may now be passed through the Browbar.

Disconnect the wires to the Bulb from the terminal block on the PCB.

Remove the Hinge Clamp and its associated screw to release the unit from the Browbar.

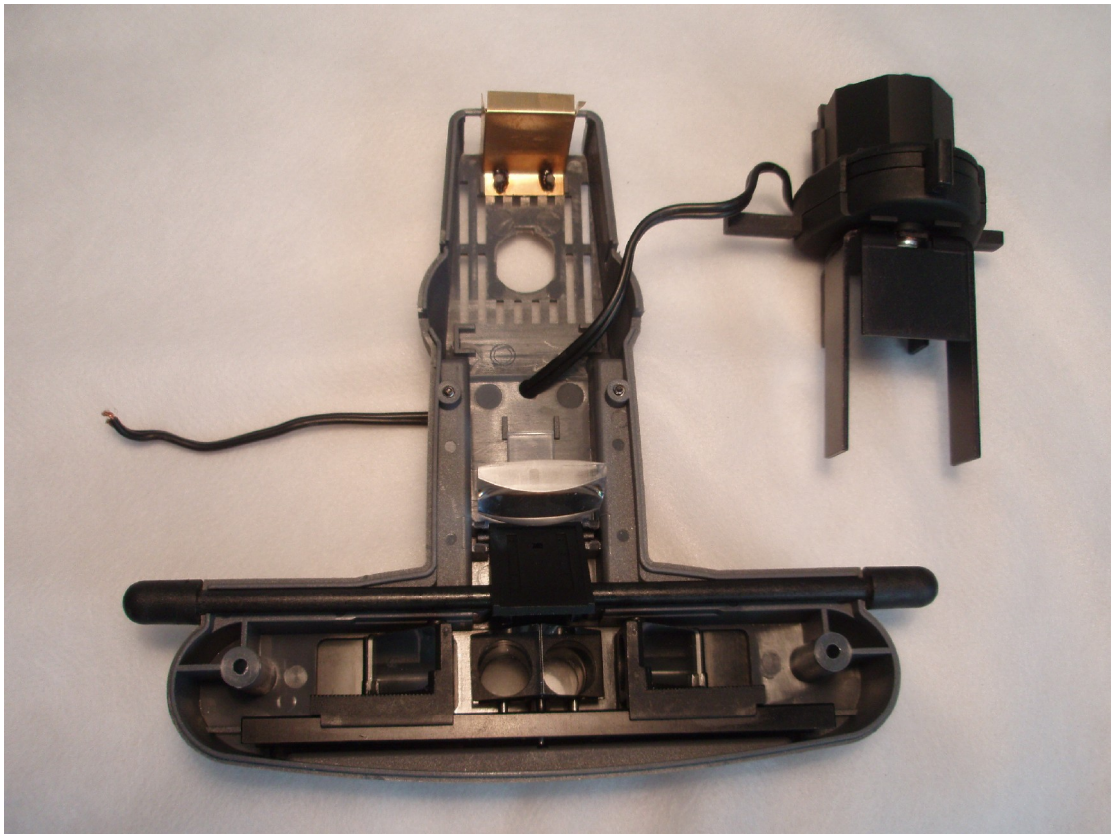


Remove the Bulb.

Remove the 4 self tap screws indicated ‘A’ above.

Turn the unit over and lift the Front Cover off carefully disengaging the clips ‘B’ holding the front and rear covers together.

Bulb/Filter Assy

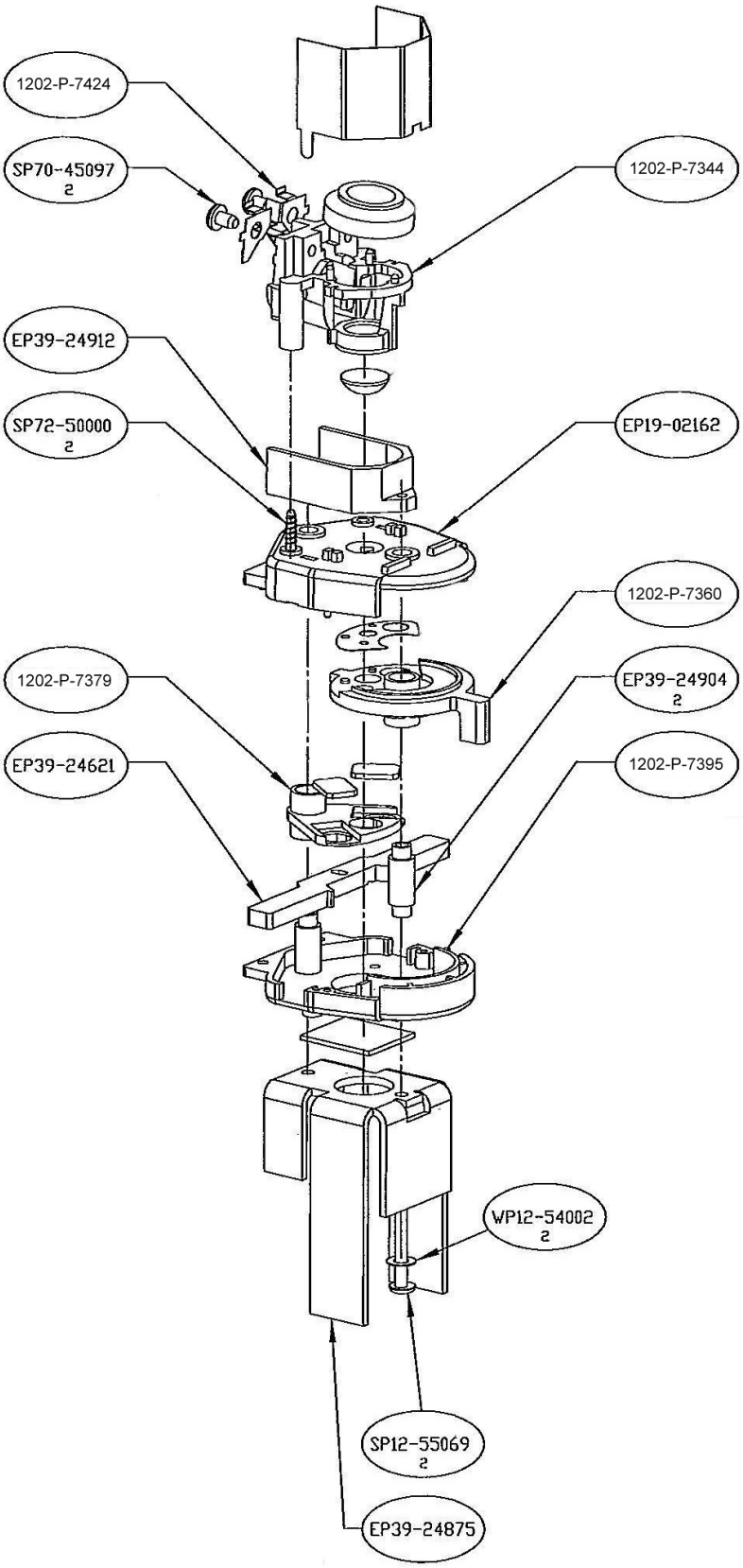


Disconnect the bulb wire from the connection on the Headband so that there are just bare wires which have to pull through the hole in the Rear Cover

Carefully remove the Bulb/Filter block noting the wire going through the Rear Cover.

Bulb Contacts

The Bulb Contacts can be changed by unscrewing 2 off self tapping screws.


1202-P-7424
SP70-45097
2
1202-P-7344
EP39-24912
SP72-50000
2
EP19-02162
1202-P-7360
1202-P-7379
EP39-24904
2
EP39-24621
1202-P-7395
WP12-54002
2
SP12-55069
2
EP39-24875

Remove the Heatsink (EP39-24875) by removing 2 off M2.5 x 12 Pozi pan head screws.

Carefully remove the Filter Bottom Cover (1202-P-7395). NOTE there are 2 small springs and 2 ball bearings inside.

Remove the remaining components – Filter Assy, 2 off Pillars, Filter Selector Bar and Stop Assy.

Remove 2 off 2.5 x 12 self tapping screws from inside the Filter Top Cover Assy.

This will release the Bulb Holder Assy and Bulb Block Base.

The Bulb/Filter Assy can now be rebuilt replacing any assemblies/ components as required.

Position the Bulb Holder Assy with the Mirror and Contacts at the bottom.

Place the Bulb Block Base (EP39-24912) onto the Bulb Holder Assy so that the lens shows through.

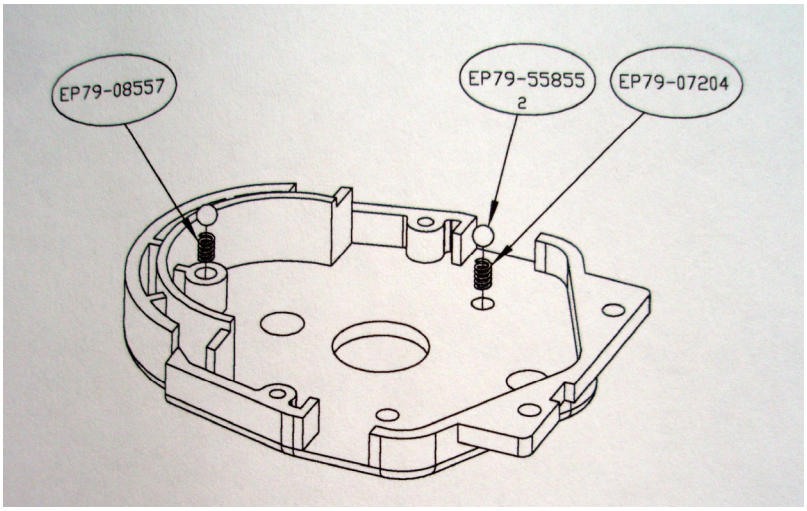
Place the Filter Top Cover Assy (1202-P-7352) over the holder and base aligning the 2 countersunk holes over the pillars on the Bulb holder Assy. Fit 2 off 2.5 x 12 C/SK screws to join the parts together.

Now take the Filter Bottom Cover Assy and lay it with the infra red filter at the bottom as shown.

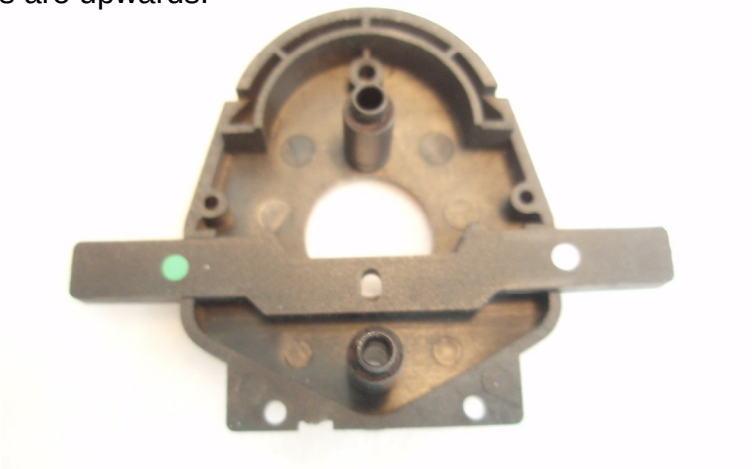
Fit 2 Pillars (EP39-24904) as shown ensuring that the grooves at the bottom.

Fit 2 off Springs and 2 off Balls as shown noting that EP79-08557 is stiffer than EP79-07204.

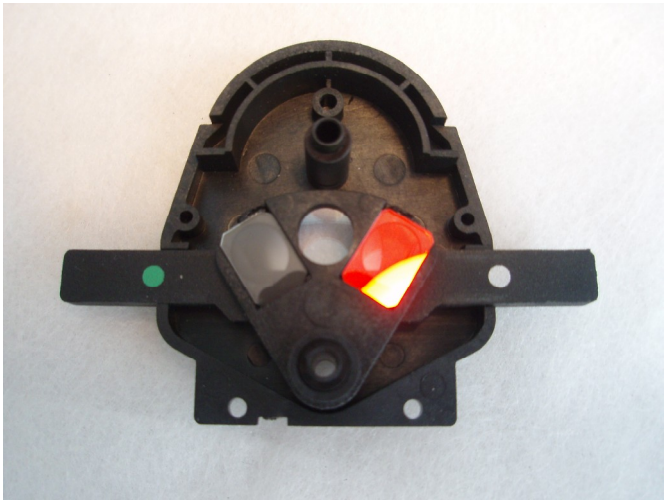
Place 1 Ball (EP79-55855) on top of each Spring.



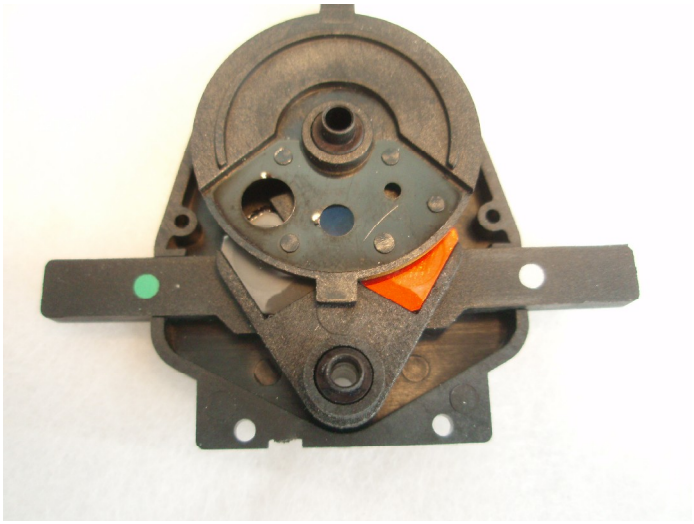
Position Filter Selection Bar (EP39-24621) as shown ensuring that the coloured dots are upwards.



Fit the Filter Assy (1202-P-7379) over the Pillar by the Filter Bar



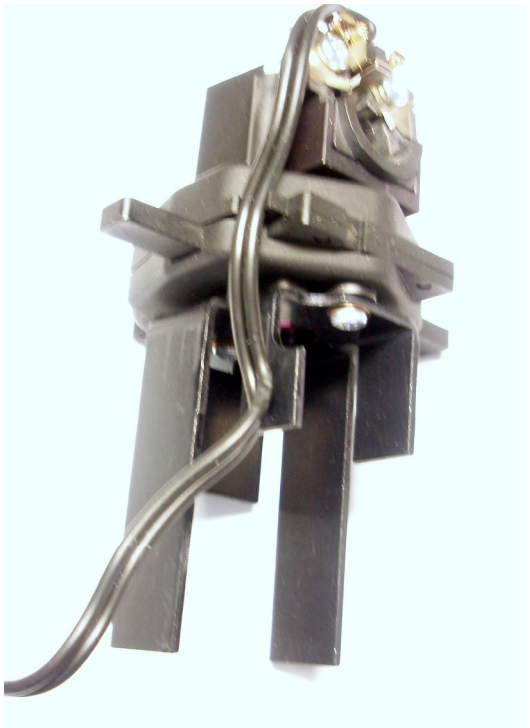
Fit the Stop Assy (1202-P-7360) over the remaining Pillar.



Carefully fit the Bulb Holder and Filter Top Housing Assy over the Filters ensuring that the Filters are not disturbed allowing the detent balls to move.

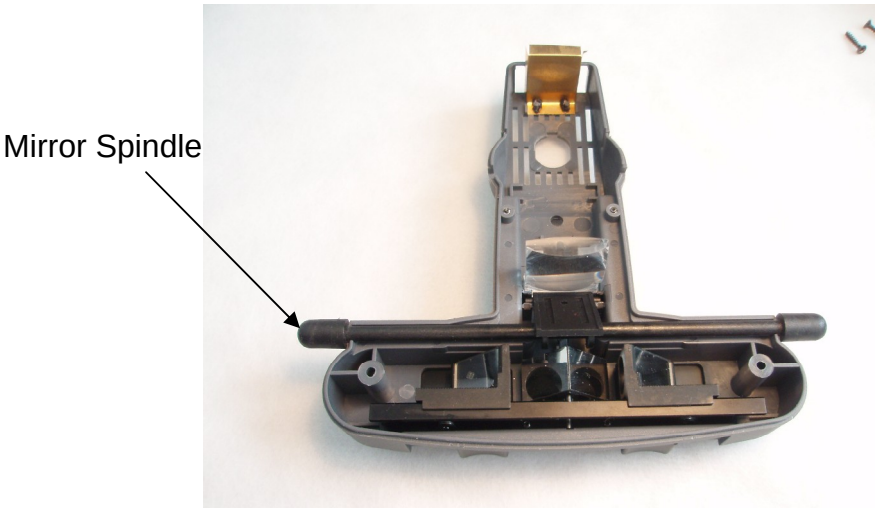
Carefully fit the Heatsink ensuring that it is correctly orientated using 2 off M2.5 x 20 pan head screws and 2 off M2.5 crinkle washers. Check that both the Filter Bar and the Stop detents are working, if not carefully remove the Heatsink and Bulb Holder/Filter Top Cove, remove the Filter and Stop wheels to replace the balls and repeat the assembly instructions above.

Carefully thread the cable through the hole on the Rear Cover and offer the Bulb Holder/Filter Assy into the Rear Cover ensuring that the cable is routed around the Bulb Holder and through the retaining slot.



Light Mirror

Remove the Mirror Spindle by drawing it towards you.



Carefully lift the Mirror and unhook the Spring. The Mirror can now be clicked out.

DO NOT TOUCH THE MIRROR SURFACE

To replace the Mirror Assy.

Attach the Spring (EP39-04292) to the tag on the rear of the Mirror Assy.

Carefully click the Mirror into place on the Rear cover Assy with the silvered side towards the front.

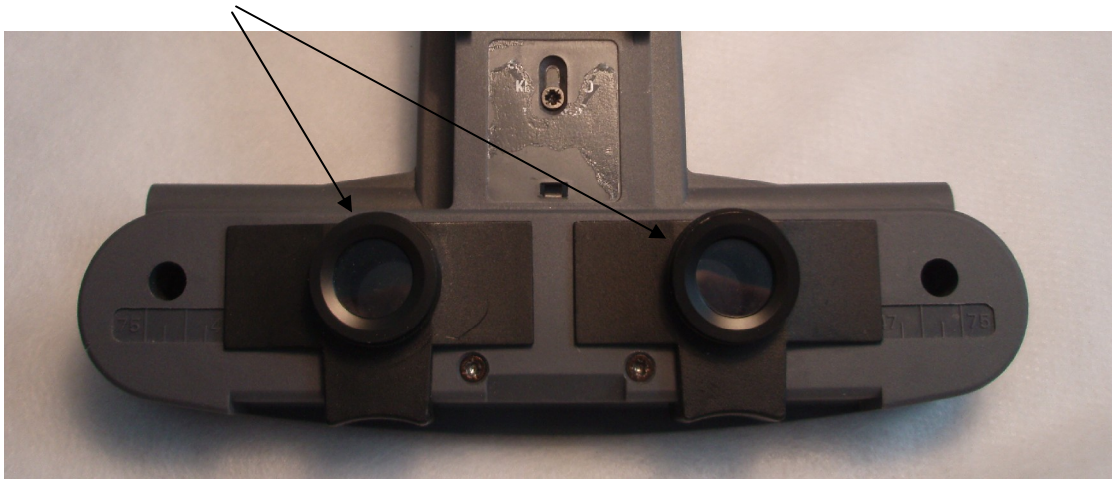
Carefully lift the Mirror and hook the Spring into place on the hook moulded into the Rear Cover Assy,

Carefully lift the Mirror Assy and replace the Mirror Spindle.

Check that rotating the Mirror Spindle changes the angle of the Mirror.

Optical Block

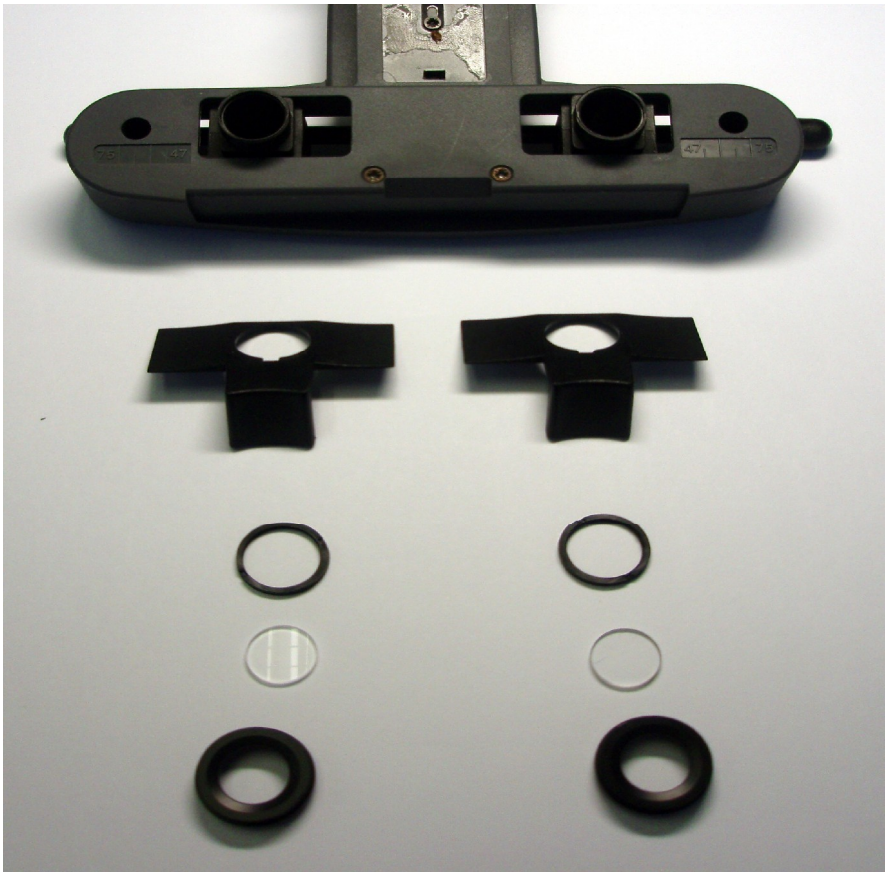
Unscrew 2 off Eyepiece Caps



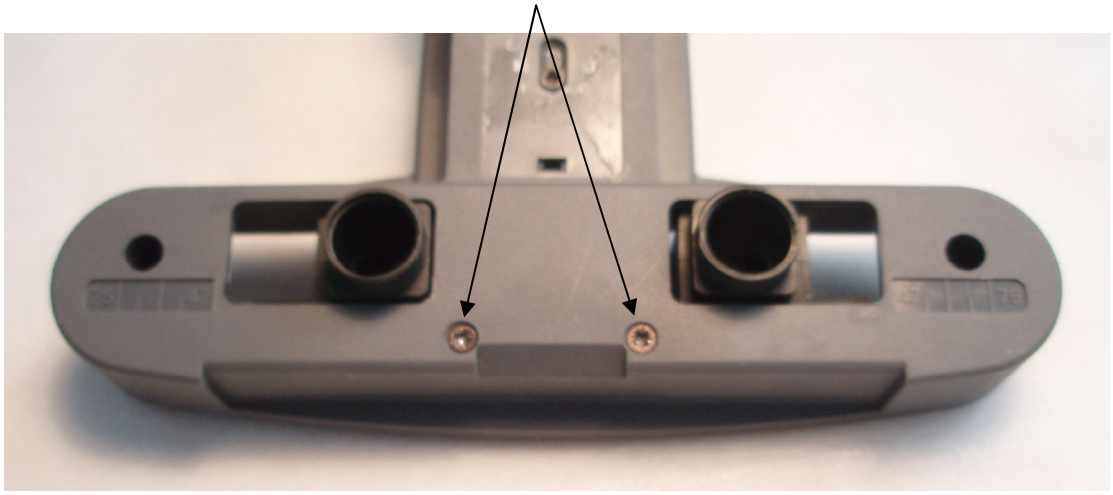
Remove 2 off Eye Lens

Unscrew 2 off PD Knob Locking Rings using the Lockring Key

Remove 2 off PD Adjusters



Remove 2 off M2.5 x 12 CSK Black screws



Carefully remove the Optical Block Assy.

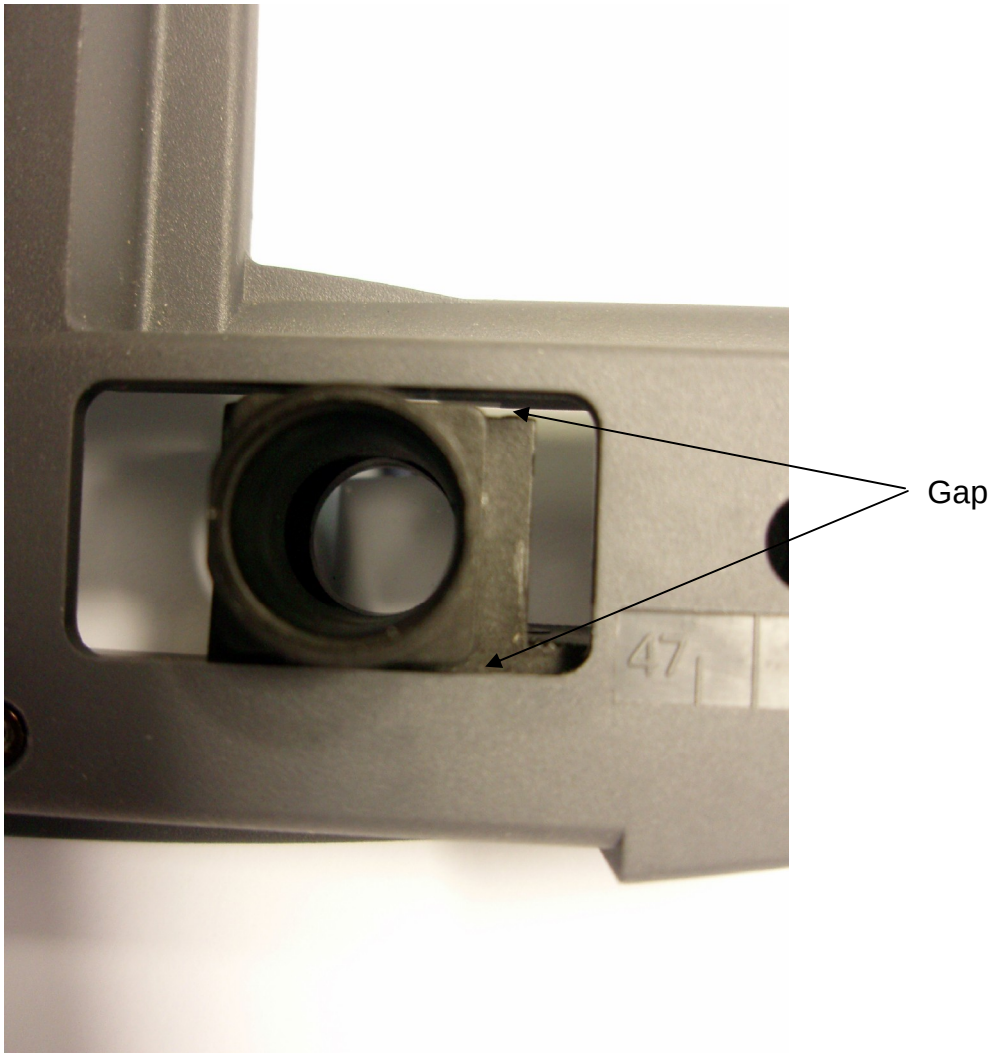
Do Not Touch the Mirror Surfaces

Do Not adjust the Central Mirror Assy – it is set up on a laser jig

Replace Optical Block

Offer the Optical Block into the Rear Cover Assy. Take care not to touch the mirror surfaces and not to distort the Optical Block Assy.

Fit 2 off M2.5 x 12 CSK Black screws as shown above and carefully tighten ensuring that the telescopes do not touch either the bottom or the top of the slots in the Rear Cover Assy as indicated below.



Fit 2 off PD Adjusters (EP29-05146)

Fit 2 off PD Knob Locking Rings (EP39-53991) using the Lockring Key

Fit 2 off Eye Lens (EP39-53721)

Fit 2 off Eyepiece Cap (EP39-53641)

Check that the telescopes slide freely across their slots.

Final Assembly

Set the Stop Control to its mid position

Set the Mirror Spindle so that the Mirror is pointing upwards at the top of the cam on the spindle.

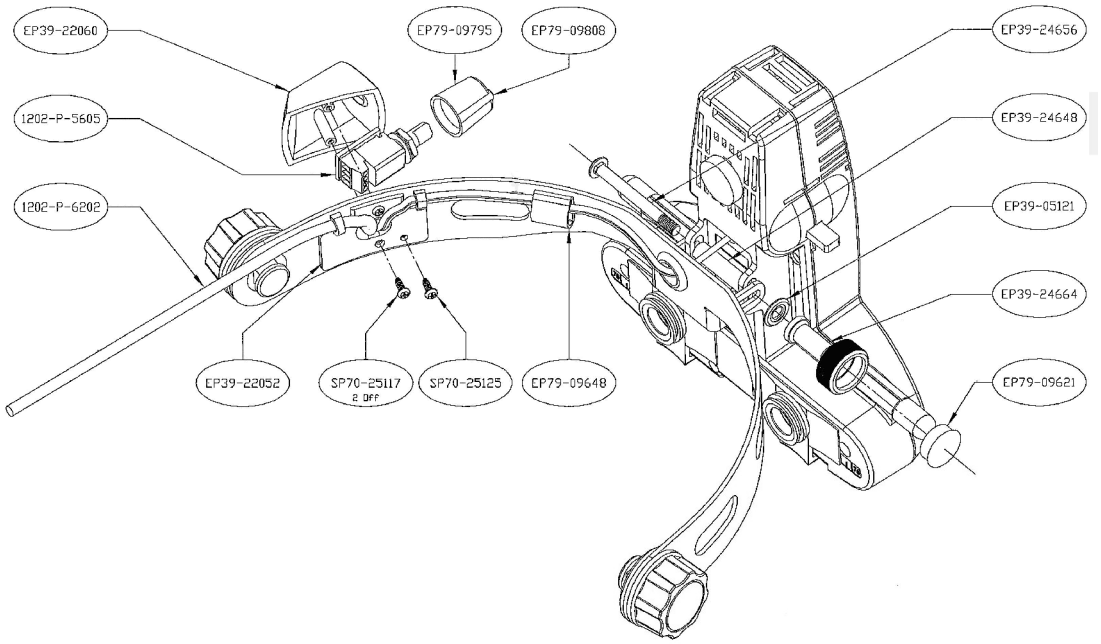
Carefully hook the tabs at the top of the Front Cover into the corresponding slots on the Rear Cover and gently bring the Front Cover together with the Rear Cover. Ensure that the Light Shield attached to the Front Cover sits under the Mirror.

Fit 4 off 2.5 x 12 self tapping CSK screws to join the covers together.

Check that all controls work correctly.

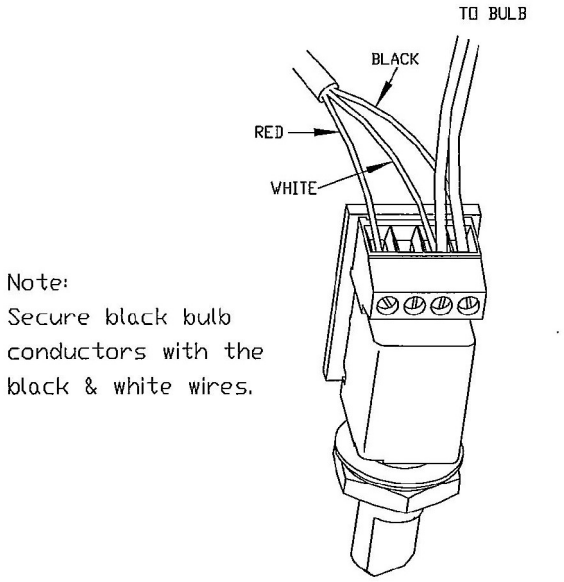
Re-attach the unit to the Browbar, carefully feeding the cable through the hole in the Browbar.

Feed the cable along the inside of the Browbar



Replace Dimmer PCB

Re-connect the wires to the PCB (1202-P-5605) as shown.



Feed the PCB through the Browbar.

Fit the PCB to the Control Cover (EP39-22060) using the washer and nut provided.

Attach the Control Cover to the Browbar using only the top ⅜" self tapping screw.

Fit the Cable guide (EP39-22052) using the remaining ⅜" self tapping screw and 1 off ¼" self tapping screw.

Refit the Knob, tighten the Allen screw.

Refit the white trim.

Adjust the Light Patch

The quality of the light patch can be adjusted by removing the label in the middle of the back if the Rear Cover, loosen the screw holding the Aspheric Lens but do not remove it. Slide the Lens (EP39-04348) up and down until the light patch is optimal.

Spares

Spare parts are available as listed on the following list. Due to the use of jigs and special tools in our manufacturing area some parts are only available as sub-assemblies as listed.

Two additional parts 1202-P-7416 (Baseplate Extras) and 1202-P-7432 (Fixings) are collections of small parts which are also only supplied as collections.

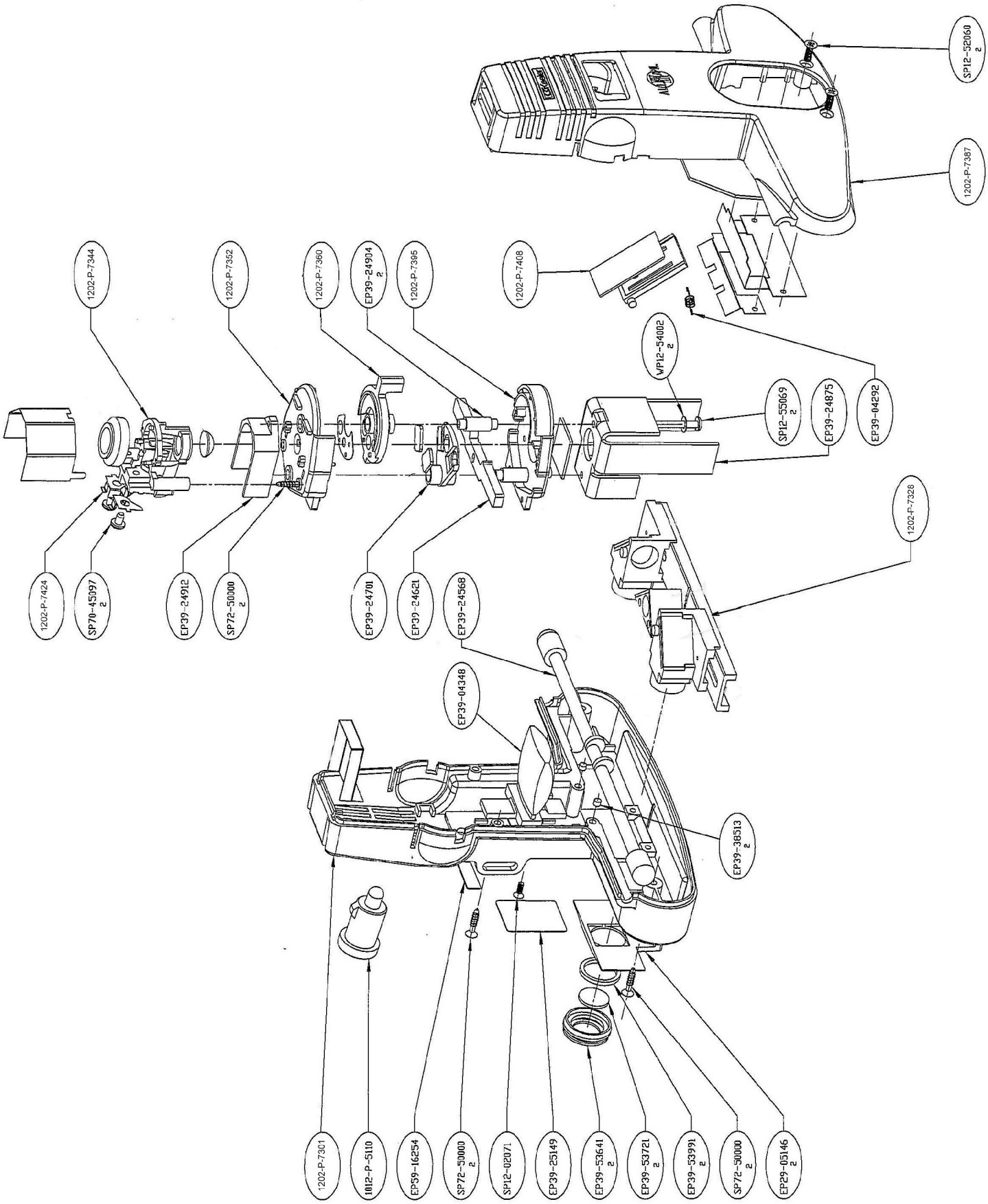
Current prices for spare parts are available from Technical Service.

Technical Service
Keeler Ltd
Clewer Hill Road
Windsor
Berks
SL4 4AA

Phone +44 (0)1753 827110

Fax +44 (0)1753 827114

Exploded Drawing



Parts List

1202-P-7301	Rear Cover Assy
1202-P-7328	Baseplate Assy
1202-P-7344	Bulb Holder Assy
1202-P-7352	Filter Top Cover Assy
1202-P-7360	Stop Assy
1202-P-7379	Filter Assy
1202-P-7387	Front Cover Assy
1202-P-7395	Filter bottom Cover Assy
1202-P-7408	Mirror Assy
1202-P-7416	Baseplate Extras
1202-P-7424	Bulb Contacts
1202-P-7432	Fixings etc
1202-P-5605	DIMMER PCB ASSEMBLY
1299-P-5117	HEADBAND-API 2 / 2
EP29-05197	BROW BAR API2/2
EP39-04348	ASPHERIC LENS M/C
EP39-22060	CONTROL HOUSING
EP39-24568	MIRROR SPINDLE AP12
EP39-24621	FILTER SELECTOR BAR
EP39-24648	SPACER - API 2
EP39-24656	HINGE PIN
EP39-24664	HINGE CLAMP
EP39-24875	HEAT SINK
EP39-24904	SPACER
EP39-24904	SPACER
EP39-24912	BULB BLOCK BASE
EP79-09795	KNOB BLACK 16mm DIA A1016069

1202-P-7416 (Baseplate Fixings etc) comprises the following

PD ADJUSTER

EYEPIECE CAP

EYE LENS +2D

P.D. KNOB LOCK RING

1202-P-7432 (Fixings) comprises the following

MIRROR SPRING

Fison Washer

CABLE GUIDE

FRICTION PAD

SPRING C1-007A-1-SS

SPRING CI -008A - 1MW

HOLE PLUG Ref: 432 1672

CABLE CLIP 0917032

INDICATOR PIN – BLUE

STEEL BALL 2MM DIA (CARB-CHRO)

SCREW M2X6 CSK HD POZI BLACK

SCREW.M2 X 8 CSK POZI BLK

SCREW M2.5X12 CSK HD POZI BLK.

SCREW M2.5 X 20 PAN HD POZI

SCREW 2X3/8 SELF-TAP-BLK POZI

No2 x 1/4" PAN POZI S/TAP C/BLK

SCREW ST No4 BX4 5LG PN HD POZ

M1.7 X 5.0 PT CSK REC BLK

SCREW TYPE PT 2.5 x 12 C/SK

WASHER M2.5 CRINKLE